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A Method of Accounting for Scrap

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A METHOD OF ACCOUNTING FOR SCRAP*

It is not the purpose of this paper to attempt to cover the whole question of accounting for scrap, but simply to discuss and illustrate one method which may be used when it is impracticable to credit scrap values directly to the orders. It should be borne in mind that the principles suggested apply to scrap which results from the necessary re-working of the material. Scrap created through inefficiency or as a result of accidents of one kind or another would require entirely different treatment.

The handling of scrap detail, like most other detail of a similar nature, must be dependent upon the peculiar conditions which apply in each particular case. Moreover, in order to analyze these conditions intelligently, and in order to reach logical decisions, it is first necessary to decide the fundamental relation which scrap bears to raw material and to the finished product. In determining this relation, the solution which ordinarily first suggests itself is the one which lies along the line of least resistance, and it is probably for this reason that scrap credits are frequently made to general overhead or to miscellaneous income account. The first analysis is likely to follow a line of reasoning and result in a conclusion somewhat as follows:

> The treatment of scrap credits is at best only a sort of necessary evil. It will require a vast amount of detail even to approximate the proportionate values of scrap produced in making each kind of finished product from the same original unit of raw material. It will require further detail to distribute, even by approximation, the credits due to each line of finished goods. I will therefore credit the value of scrap to general overhead.

The unsoundness of this procedure is at once apparent if it be remembered that scrap is an item relating entirely to material costs and cannot, by any line of reasoning, be associated with the items making up general overhead. It would be quite as logical to consider returns and allowances as an added cost of sales instead of as a reduction of the sales. All scrap credits should apply directly or indirectly against raw material costs unless such a procedure is absolutely impracticable or impossible.

*This article is based upon a paper read before the Cleveland Chapter of the National Association of Cost Accountants.

This is especially true when the scrap has a recoverable value as raw material.

Of course the ideal method would be to credit the scrap value directly to individual orders or items, but it is the intention to confine this paper strictly to those cases in which this procedure is impossible.

In the concrete illustrations which are given below it will be noted that to some extent they are all typical of conditions which may be found in almost any plant. In each case an attempt to deduct scrap from raw material costs has proved itself to be well worth the initial trouble. In making an analysis of the governing conditions in each case it was found, for one reason or another, impractical to determine the actual amount of scrap produced by individual orders or items. It was therefore necessary to determine the amount of the credit which should be made to the order in some other way. The problem which presented itself in each case was the same, namely:

The production of scrap of high raw material value.

The impossibility, under the conditions, of crediting the orders with actual values produced.

How to handle the values in such a way as to distribute them as equitably as possible to the several items entitled to these credits.

The solution which is suggested as the most feasible and at the same time the most logical, may be summarized as follows:

Establish a standard unit raw material quantity charge for each item, and also a standard salvage credit if this be possible.

Charge each order or item with the total raw material requisitioned against it.

Credit each order or item with its proportion of salvaged material as determined from the standard unit quantity charge or credit, charging salvage account with the amount of the credit adjustment. Salvage value must be determined in each case according to the use which is to be made of the salvaged material.

Credit salvage account and charge, according to requisitions, the order or item using the scrap as raw material, pricing it at the same figure as that at which salvage account is charged.

The step in this solution which has been the most difficult to apply in practice, and which therefore is liable to cause the greatest hesitancy, is the fixing of standard unit quantities. In most cases this has involved a careful compilation of records and

painstaking consideration of a large amount of detail. In others it has required an analysis of available data covering a previous period. In still other cases it has entailed a first hand gathering of facts in the shop. But no matter how difficult or tedious it may be to obtain this information, the results have always more than justified the effort involved.

After this first and most difficult part of the problem has been worked out, the succeeding steps can be easily followed because they are largely a matter of adapting routine that is likely to be already present in any efficient cost system, to the special needs of a particular problem.

Before citing several concrete examples, what has already been discussed may be summarized:

The theoretically correct and ideal method of handling scrap would be to credit the individual order or item with the value of the scrap actually produced, but such treatment is not always practical.

Salvaged material value is properly a credit against raw material costs.

Whenever the actual amount of credit cannot be determined, use the standard quantity charges or credits as a basis of crediting the order.

Keeping these points in mind, let us consider a few actual cases which, in varying degrees, present the problem under discussion and serve to illustrate how the suggested solution will work out in practice.

Case 1

In the manufacture of machine tools ends of nearly equal length were left after two shafts of different lengths and for different orders had been cut from bars of standard size shafting. Previous to the analysis, each order had been charged with its proportion of the material drawn from stock, and the ends were sent to the scrap pile and sold at a very low figure. However, it was found that the ends could be used advantageously for making certain special parts of another product fabricated by the same concern. As soon as the actual facts were established, instructions were given to return the usable ends to the stock room on returned material memos. These memos were applied to the two orders in proportion to the material required for each. The price at which credit was made was based on the raw material value of the pieces recovered from scrap less the extra labor involved in using these short pieces. The original orders, therefore, were charged with the cost of the material used plus the loss in value of the material which was salvaged. While the

saving thus effected was small in comparison with the total costs on the two finished articles, it nevertheless amounted to a considerable sum in the course of the year.

This case is mentioned first because of its simplicity and because it presents conditions for the actual solution of the problem which are almost ideal.

Case 2

A firm manufacturing a line of enameled steel reflectors utilizes the waste clippings from the ends and sides of the sheets in fabricating lamp sockets, which are sold as a separate item. At the time this problem was worked out special size sheets could not be obtained and for that reason standard size sheets were used.

For various reasons this case presented more difficulties than did case No. 1. In the first place, a set of standard unit quantity charges for all of the various sizes and styles of reflectors—about forty all told—had to be compiled. This standard unit quantity represents the amount of steel in the square sheared blank from which the circular blank is cut. Because the usable scrap comes from the ends and sides of the sheets, the amount per reflector varies with different sizes of standard sheets.

In some cases, in order to use the sheets advantageously, two or more sizes of blanks are cut from one sheet. Under this method the proportion of scrap obtained from different blanks varies considerably. Therefore it was necessary to know the size of sheet from which each blank would be cut, in order to determine the quantity of usable scrap which would result from each size of reflector. The value of this scrap was then determined from the use which could be made of it.

Steel sheets are requisitioned in the usual manner, but are charged to the department instead of to the order. The quantity material charge for each order is obtained by extending the standards by the quantities produced. These quantities are then charged to the orders and the department accounts credited. The quantities are extended at a price which makes allowance for usable scrap.

The value placed on usable scrap is based on the cost of good material, less the additional labor required to handle scrap instead of the good material. This amount is also credited to the department account, the charge being made to the salvage account.

The debit remaining in the department account is then charged to the orders in proportion to the quantity of material

used on each. This charge is shown in the material section of the cost sheet opposite the caption "Scrap Loss."

On first thought it would seem very simple to weigh the usable scrap from an order and have it returned to stock on a credit memo, in the same way as was done with the ends of shafting in Case No. 1. However, in actual practice this was found to be impractical and was abandoned in favor of the plan of pre-determining the amounts as outlined above.

When an order for sockets is put through, the available strips are requisitioned and the credit is made to the salvage account at the reduced price. If further stock is necessary (as is sometimes the case) sheets are requisitioned and credited to the proper stock ledger item at full price.

Case 3

In the manufacture of fractional horsepower motors of certain sizes a considerable weight of usable sheet copper is available from center punchings blanked from rotor end rings. These blanks are used on another motor of smaller size and with practically no more loss than if sheets of new stock were used. This is a case in which scrap recovered from the first order is worth fully as much as the raw material in the sheets.

The size of the blank is 3x3 inches. The actual area of the larger ring is 2.1599 square inches, and of the smaller ring is 1.7671 square inches. The scrap, including the center punching and the corners, amounts to 5.073 square inches. Of the material actually entering into the rings, 55% is used for the large ring and 45% for the smaller ring. The difference between the raw material value and the scrap value, of the 5.073 square inches, is charged in the proportion of 55% to the larger ring and 45% to the smaller ring.

Requisitions for the material for the larger ring are really requisitions for material for both rings. Instead of charging the amount of the requisitions to the first order and then crediting it and charging the salvage account, the total cost of the material is applied by charging the order for each ring with its proportion of the material and by charging the scrap value to the scrap account. In this way a reduction of the material cost is made on each order because the loss due to scrap is less than it would be if each ring were cut from a separate blank.

It will, of course, be recognized that this was a case of continuous production of both motors. Some variation of the plan would be necessary and could be worked out if the quantities of each size of motor produced were not the same.

On both cost sheets the notation was made to the effect that

the material cost would be higher if the production of either size motor should be curtailed.

Case 4

In the manufacture of a line of brass goods all chips from the machine departments are used as raw material in the foundry. Even as salable scrap these chips are of comparatively high value. The proportion of chips machined from different castings varies considerably. From the standpoint of accuracy, therefore, it is essential that each part be credited with the approximate value of chips which it yields.

So far as the establishment of standards was concerned, the main problem therefore was to compile a list of rough castings unit weights and a corresponding list of machined castings unit weights. This was done by requiring the weight as well as the count of all castings for a certain period of time. By subtracting the finished unit weight from the corresponding rough weight there was established a standard unit quantity representing the weight of chips yielded by the machining of each kind of casting. The value of chips was fixed at the current market price.

The unit credit value for chips for a particular casting, multiplied by the number of castings machined on an order, gives the total credit value due the order for chips recovered. There is a small difference between the actual weight of chips and the amount figured as a result of the standard allowance. This is absorbed proportionately by all orders. For the purpose of closing out the month's figures, the chip credits are collected on a voucher and the total is shown as a credit to work in process and a charge to the scrap account.

As the chips are returned to the foundry, a clerk makes a record of the weights of the various lots, furnishing the cost department with a weekly report of the total.

The reports for any one month are brought together on a voucher and the weight of the chips extended at current prices. The total value thus obtained is credited to scrap account and charged to foundry material.

In closing permit me to point out again that we have been discussing only one method of handling scrap. There may be some objection to the methods illustrated on the ground that they require too much detail, but it must be borne in mind that each case was one of continuous production and that after the standards had been once established no extra work was required.

The economies which were effected and the more accurate information which was obtained in each case would seem to more than justify the initial study and work required under the various methods which have been described.